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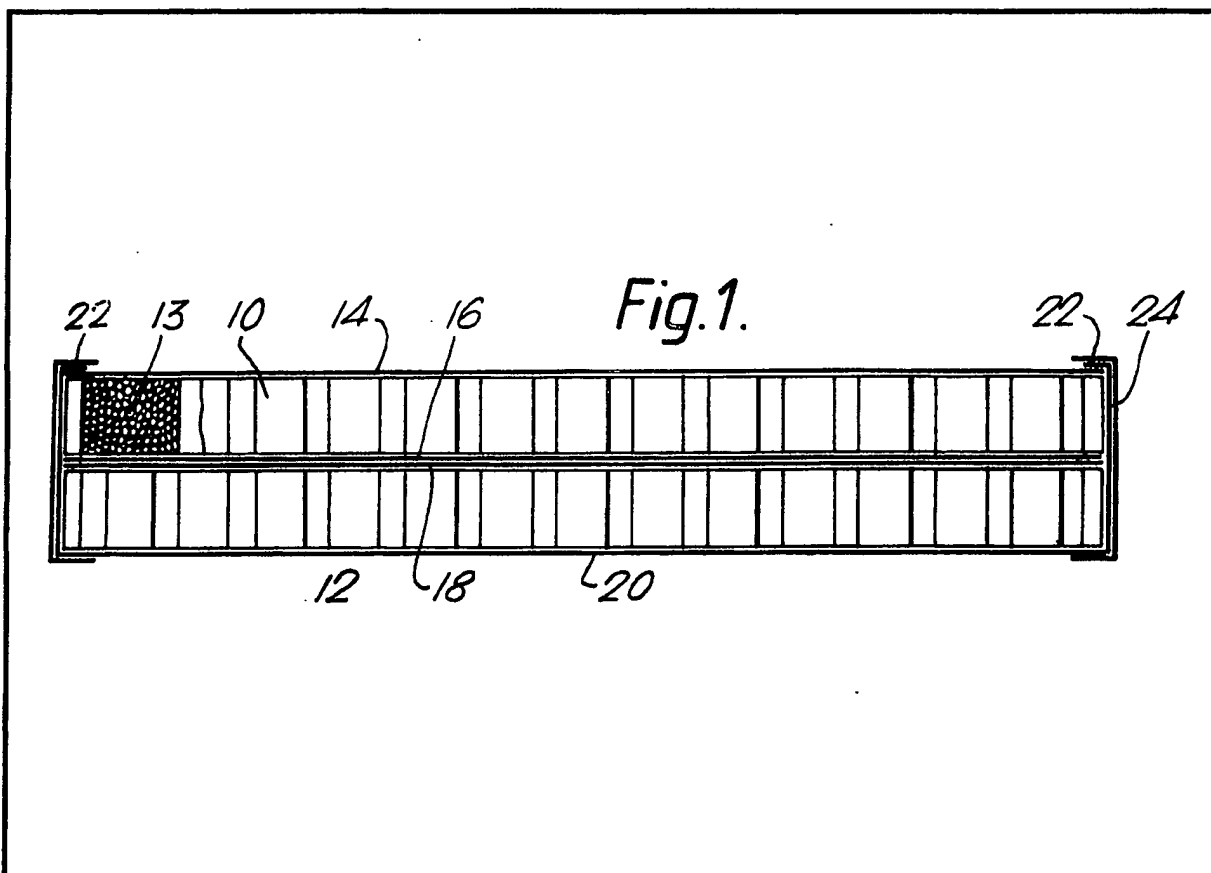
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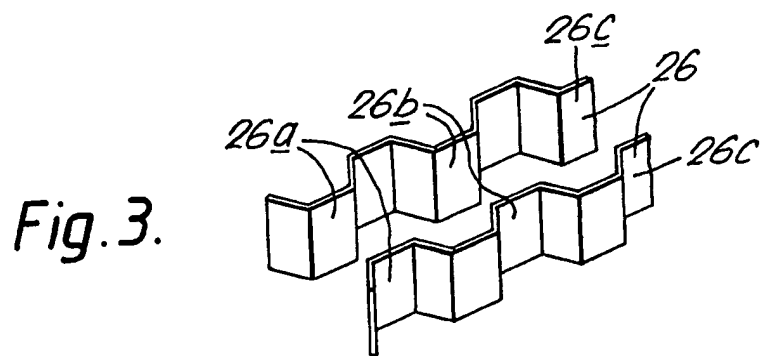
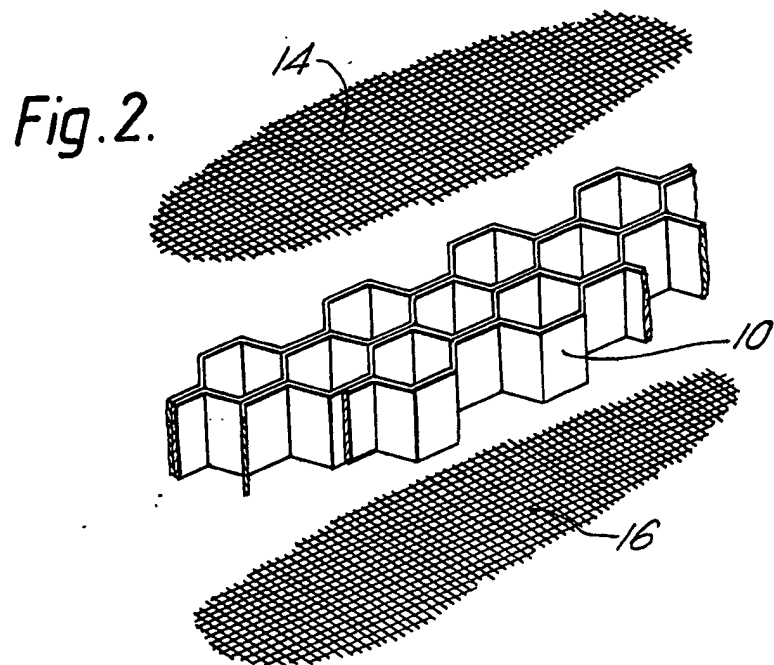
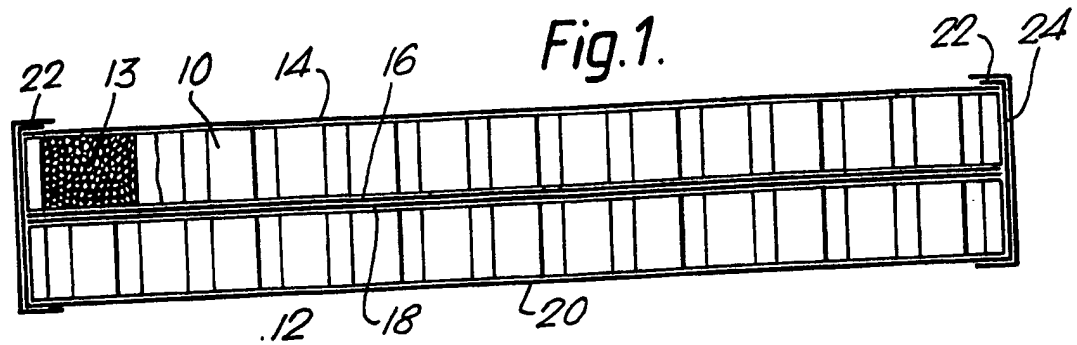
(54) An activated carbon filter for
withstanding high temperatures

(57) An activated carbon filter comprises one or more cellular layers (10, 12) formed of steel or other metal of high-melting point, the cells of the said layer containing activated carbon particles or granules (13) and being closed at their ends by layers (14, 16, 18, 20) of a fabric woven from strands or threads of steel or of some other metal or substance having a high melting point.



The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

GB 2 050 194 A



SPECIFICATION

An activated carbon filter for withstanding high temperatures

This invention relates to an activated carbon filter for withstanding high temperatures.

In a number of prior British Patents—for example, Patents Nos. 1,180,888;

1,225,751; and 1,505,843—I have described filters for filtering air and other gases having one or more filter elements each comprising one or more layers of cellular material the cells of which contain particles or granules of activated carbon so as to remove toxic gases and other toxic substances from air or other gas flowing through the filter. The ends of the cells are generally closed by layers of air-permeable material such as a woven fabric or thin layers of foamed synthetic plastics material such as polyurethane foam. The layers of air-permeable material are bonded to the ends of the cells by the use of grilles, mesh or other openwork layers formed of metal and coated with a synthetic plastics bonding material. In most commercial arrangements these layers are formed of criss-crossing metal rods which are welded together where they cross.

The cellular material is generally made of paper—for example, Kraft paper—which has been impregnated with a resin such as a phenolic resin or an epoxide resin.

Such filters have a wide variety of applications but they cannot be used where they are liable to be subjected to very high temperatures. The aim of the present invention therefore is to provide an activated carbon filter which is capable of withstanding such high temperatures.

With this aim in view, an activated carbon filter comprises a cellular layer formed of steel or other metal of high-melting point, the cells of the said layer containing activated carbon particles or granules and being closed at their ends by layers of a fabric woven from strands or threads of steel or of some other metal or substance having a high melting point.

Preferably, the cellular layer is formed of stainless steel, while the fabric is also woven from strands or threads of stainless steel, the fabric being welded to the ends of the cells.

An example of a filter in accordance with the invention is shown in the accompanying drawings, in which—

Figure 1 is a vertical section through the filter;

Figure 2 is an exploded perspective view through one cellular layer of the filter shown in Fig. 1 to illustrate the way in which the ends of the cells are closed; and

Figure 3 is an exploded perspective view illustrating the manner in which each cellular layer is fabricated from steel or other metal of high melting point.

Fig. 1 shows an activated carbon filter for withstanding high temperatures. It comprises two cellular layers 10 and 12 which are arranged one on top of each other but with the cells of the layer 10 out of alignment with the cells of the layer 12. This is deliberate to ensure good "scrubbing" of the air or other gaseous fluid passing through the filter during normal use. The ends of the cells in each cellular layer are closed by layers of fabric woven from strands or threads of steel or some other metal or substance having a high melting point. Thus, the upper ends of the cells in the cellular layer 10 are closed by a fabric layer 14, the lower ends of those cells by a fabric layer 16, the upper ends of the cells in the cellular layer 12 by a fabric layer 18 and the lower ends of those cells by a fabric layer 20. The fabric layer 20 also extends round the sides or edge portions of the two cellular layers so as to overlap the upper fabric layer 14 at 22. The two cellular layers 10 and 12 as well as the fabric layers 14, 16, 18 and 20 are enclosed in a steel frame 24 of channel section.

Fig. 2 shows the fabric layers 14 and 16 and the upper cellular layer 10. The two layers 14 and 16 are secured to the cellular layer 10 by being welded to the latter.

Fig. 3 shows the way in which each cellular layer 10 and 12 is built up from strips or bands of steel 26. As will be seen, each strip or band is provided with bent portions which produce cells once the bands or strips are brought together and then welded to one another. Thus, the faces 26a will be welded together, as will be the faces 26b and the faces 26c.

In order that the filter units may be long-lasting and not suffer from corrosion, the best material to use for the cellular layers and for the fabric layers 14, 16, 18 and 20 is stainless steel. It is however to be understood that other steel can be used instead, or some other metal or substance having a high melting point. For example, the cellular layers 10 and 12 could equally well be made out of nickel or a nickel steel alloy while the woven fabric layers 14, 16, 18 and 20 could be woven from carbon fibres or from a metal such as tungsten or nickel.

Filters in accordance with the present invention are especially suitable for safeguarding installations where it is important for the filters not to be destroyed should fire break out.

CLAIMS

1. An activated carbon filter comprising a cellular layer formed of steel or other metal of high-melting point, the cells of the said layer containing activated carbon particles or granules and being closed at their ends by layers of a fabric woven from strands or threads of steel or of some other metal or substance having a high melting point.

2. A filter according to claim 1, in which the cellular layer is formed of stainless steel, while the fabric is also woven from strands or threads of stainless steel, the fabric being

5 welded to the ends of the cells.

3. A filter according to claim 1 or claim 2 having at least two cellular layers which are arranged one on top of the other but with the cells of one layer out of alignment with the

10 cells of the other layer.

4. A filter according to any one of claims 1-3, in which at least one of the fabric layers extends round the sides or edge portions of the cellular layer or layers so as to overlap the

15 other, or another, fabric layer.

5. A filter according to any preceding claim in which the cellular layer or layers and the fabric layers are surrounded by a steel or other metal frame of channel section.

6. A filter according to any preceding claim, in which the cellular layer, or each cellular layer, is built up from metal strips or bands each provided with bent portions which produce cells once the bands or strips are brought together and then welded to one

7. A filter according to claim 1, in which the cellular layer, or each cellular layer, is made of nickel or a nickel steel alloy, while the fabric layers are woven from carbon fibres or from strands or threads of tungsten or nickel.

8. An activated carbon filter substantially as described herein with reference to the accompanying drawing.